



THE UNIVERSITY OF
WESTERN AUSTRALIA
Achieve International Excellence

The UWA Oceans Institute
Annual Report
2010



THE UWA OCEANS INSTITUTE TEAMS UP WITH CSIRO ABOARD THE RV SOUTHERN SURVEYOR TO STUDY OCEANOGRAPHIC PROCESSES ALONG SOUTH-WEST WESTERN AUSTRALIA. (Photo: Yasha Hetzel)



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Our Vision

To provide Oceans Solutions for humanity's grand challenges: food and water security, energy and healthy marine ecosystems.

Our Mission

To provide Oceans Solutions to society through interdisciplinary research and research training and collaborations between UWA, the key national research providers AIMS and CSIRO, state and national government research agencies and other research intensive universities nationally and internationally.

Executive Summary

The University established The UWA Oceans Institute in late 2009 to unite marine researchers from a range of disciplines. Since then, our multidisciplinary and collaborative approach is already allowing for wider research programs that address critical marine science and resource issues.

The Oceans Institute's high-profile, official launch in March 2010 kick-started our pursuit to become not only the foremost centre for marine research in WA, but one of the leading centres for marine research in the world.

Reflecting on our first year, we see that our researchers and staff have been making their mark – both around Australia and abroad.

The quality of our research programs has been recognised with several of our researchers being awarded funding from the Australian Research Council (see p30).

Our marine ecologists and oceanographers have continued to shed light on the mysteries of the relatively unexplored Indian Ocean. One such example was the discovery of a huge deep-sea canyon near the Montebello Islands by students on a training voyage with the Australian National Network in Marine Science.

Communicating our work to colleagues has been a major focus in 2010, with 35 of our postgraduate students showcasing their research at a workshop in April, as well as throughout the year as part of our Wednesday Seminar Series. Some of the world leaders in ocean sciences visited the Institute throughout 2010 and also gave inspiring seminars as part of this series.

At the Physics of Estuaries and Coastal Seas conference, 14 –17 September 2010 in Colombo, Sri Lanka, our physical oceanographers presented their work to marine scientists from all over the world.

In 2010, three of our PhD students received awards in acknowledgement of their outstanding work (see p9).

We have formed strong collaborative links with a number of distinguished national and international organisations. Our collaborative pursuits with the Commonwealth marine research providers – the Australian Institute of Marine Science (AIMS) and CSIRO (Commonwealth Scientific and Industrial Research Organisation) have culminated in the securing of \$63 million in funding to create a new, world-class marine centre for Western Australia (see p7).

The Indian Ocean Marine Research Centre (IOMRC), based at UWA, and the Watermans Marine Research Facility will significantly boost marine science capacity in Australia and provide the means to address pressing research questions in Australia's Northwest and across the Indian Ocean.

The Oceans Institute now has a Director, Professor Carlos Duarte, who comes to us from Spain. He presently works for CSIC, the Spanish National Research Institute. Professor Duarte will start his appointment at UWA in October 2011, and will be joined by Professor Mark Cassidy as Deputy Director. Professor Cassidy is the Director at the Centre for Offshore Foundation Systems (COFS) at UWA and is also an ARC Future Fellow.

We sincerely thank our funding bodies, collaborators and industry partners. It is only through your support that the Oceans Institute has been able to get off the ground as quickly and successfully as it has.



**Winthrop Professor
Gary Kendrick**

Acting Director
The UWA Oceans Institute

Highlights of 2010



DISTINGUISHED FIGURES IN SCIENCE, INDUSTRY AND GOVERNMENT ATTENDED THE LAUNCH OF THE UWA OCEANS INSTITUTE IN MARCH 2010. Photo by Frances Andrijich.

Establishment of The UWA Oceans Institute

The UWA Oceans Institute was established late in 2009 to bring together the strengths of UWA marine researchers into an integrated research focus.

The Oceans Institute is aimed at building critical mass and creating opportunities for cross-expertise collaboration as a conduit for building interdisciplinary research in ocean studies at The University of Western Australia.

Marine teaching and research programs at the University are spread across five faculties: the Faculty of Engineering, Computing and Mathematics, the Faculty of Natural and Agricultural Sciences, the Faculty of Life and Physical Sciences, the Faculty of Law, and the Faculty of Medicine, Dentistry and Health Sciences.

Researchers in the areas of marine ecology, ocean engineering, oceanography, marine biomineralisation, marine biotechnology, and marine management and conservation have

joined the Oceans Institute as members.

About 60 marine researchers and students from two key faculties (Engineering, Computing and Mathematics and Natural and Agricultural Sciences) relocated to the refurbished building dedicated to the Oceans Institute over some months prior to March and the launch of the Oceans Institute.

A number of other researchers and students participate in Oceans Institute activities as 'members' of the Institute.

March Launch of The UWA Oceans Institute

On 24 March 2010 the Minister for Innovation and Science, the Hon Kim Carr, officially launched The University of Western Australia Oceans Institute.

Many distinguished guests and prominent figures in marine science research witnessed the launch at the University Club of WA Auditorium.

After a short video introducing the Institute, and a speech from UWA Vice Chancellor Alan Robson, Innovation and Science Minister Kim Carr officially opened the Institute.

An overview of the Oceans Institute and what it means for Western Australia was given by J.S. Toll Professor of Physics Jim Gates, of Barack Obama's Council of Advisors on Science and Technology; acting Director of the Oceans Institute Professor Gary Kendrick; UWA PhD student Shari Gallop; Premier's Research Fellow Professor Malcolm McCulloch; and CEO of AIMS, Dr Ian Poiner.

Guests were then invited to morning tea and tours of the Oceans Institute building on Edward Street.

Professor Robson said the Institute was the culmination of 10 years of

efforts to unite marine research at UWA. He said it should not only be satisfied with leading marine research in WA, but should also aim to become one of the best centres of marine research in the world.

In explaining the unification of many disciplines, Professor Gates related the Oceans Institute to his own research into the unification of quantum mechanics and relativity.

Expressing the importance of preparing the next generation of scientists and researchers, he threw his support behind the Institute's interdisciplinary approach.

Continued over



THE LAUNCH WAS AN INFORMING MORNING THAT OUTLINED A NEW FUTURE FOR MARINE SCIENCE RESEARCH IN WESTERN AUSTRALIA. Photo by Frances Andrijich.

Highlights of 2010



J.S. TOLL PROFESSOR OF PHYSICS JIM GATES AND CHANCELLOR OF UWA DR MICHAEL CHANEY AT THE OCEANS INSTITUTE LAUNCH. Photo by Frances Andrijich.

March Launch

Continued from page 5

Dr Poiner reiterated the importance of the Institute as a focal point of marine research in WA.

Professor Gary Kendrick and Senator Kim Carr both relayed the importance of collaborative efforts with state and national research agents such as AIMS and the CSIRO.

The importance of marine research along WA's massive coastline was driven home as both speakers mentioned biodiversity hotspots, collections of endemic species, economic value of marine based industry and the need for informed and practical resource management operations in WA's vast and varied marine environment.

Views on the Institute's future were given by Ms Gallop and Professor McCulloch. Ms Gallop spoke passionately about her first research experiences and how she has been given industry relevant training opportunities.

Professor McCulloch gave a brief vignette of his next research study into the calcification of coral in response to changes in atmospheric CO₂ levels, a program that he hopes will show the baseline capacity for coral reef environments to cope with CO₂ level changes.

Ministerial Visit

In February, as part of the WA Cabinet's visit to The University of Western Australia, the then Minister for Environment; Youth, the Hon Donna Faragher, visited the Oceans Institute and was given an overview of the research being undertaken.



WA PREMIER'S FELLOWS, WINTHROP PROFESSOR MALCOLM MCCULLOCH AND WINTHROP PROFESSOR SHAUN COLLIN, WITH CHIEF SCIENTIST OF WA PROFESSOR LYN BEAZLEY. Photo by Frances Andrijich.

Appointment of Director



PROFESSOR CARLOS DUARTE.
Photo by Tony Malkovic.

After an extensive process of interview and head hunting the University has offered the position of Director to Professor Carlos Duarte, from the Mediterranean Institute for Advanced Studies, Majorca.

Professor Duarte will visit Perth in early 2011 as the Leader of the Malaspina Circumnavigation Expedition, an interdisciplinary research project whose overall goals are to assess the impact of global change on the oceans and explore their biodiversity. He will take up the position in October 2011.

Indian Ocean Marine Research Centre

In June the University was awarded \$34 million towards the Indian Ocean Marine Research Centre Project from the Department of Innovation, Industry, Science and Research (DIISR) through the Education Investment Fund grant application process.

The project involves construction of a new building on the Crawley Campus for marine research and will bring together researchers and technical staff from UWA, Australian Institute of Marine Science (AIMS) who will contribute \$3 million, CSIRO who will contribute \$10 million and the State Government which will contribute \$4 million.

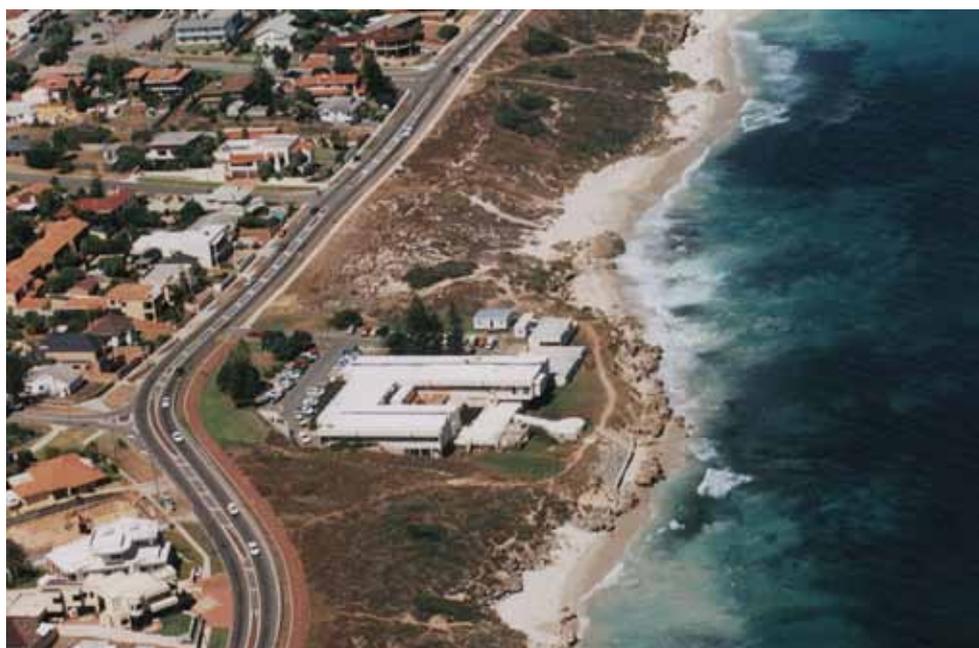
The estimated cost of this facility is \$52 million.

The project also includes refurbishment of the Watermans Bay Marine Research facility to be equipped with seawater facilities for direct experimentation. The estimated cost of this part of the project is \$11 million.

The research areas involved include:

- Offshore engineering
- Biodiversity
- Ocean policy and
- Maintenance/management of coastal infrastructure.

The Oceans Institute will contribute to the planning of the construction of the facility through membership on the project's Steering Committee.



THE WATERMANS MARINE RESEARCH FACILITY WILL RECEIVE AN \$11 MILLION UPGRADE.

Coastal and Ocean Industry Forum

In July, the Oceans Institute held a successful industry forum attended by about 120 industry and government representatives.

Dr Paul Vogel, Chair, Environmental Protection Authority (EPA), discussed issues which can affect the marine environment, such as:

- Industrial and urban development: power and water
- Port development: dredging, piling and filling, and
- Shipping: accidents and introduced marine pests.

Areas of uncertainty were identified where marine and oceanographic

research could assist the Office of the Environmental Protection Authority to fulfil its role of providing advice to Government and assessing environmental impact of proposed developments.

Gary Prattley, the Chair of the WA Planning Commission, highlighted that a core consideration of the WA Planning Commission is vulnerability or risk and identified areas where OI scientists could provide information to improve management. He noted that research should focus on WA coastal processes, building the information database, developing predictive models and running them.

Tom Baddeley, the WA Director of the Australian Petroleum Production and Exploration Association (APPEA), then identified research requirements

and trends for the oil and gas industry to assist industry in reducing its environmental footprint. He also noted the importance of understanding the relationship between dredging, water quality and the health of benthic communities, as well as the need to manage and mitigate the threat of invasive species through management practices, and the need for better data management for the good of all communities.

Attendees then had the opportunity to question panel members and view a small exhibition of OI research activities.

It is planned to hold similar forums at least annually.



PRO VICE-CHANCELLOR (RESEARCH) PROFESSOR ALISTAR ROBERTSON GIVING THE WELCOMING ADDRESS.
Photo by Jarrad Seng.

Appointments and Awards

Winthrop Professor Malcolm McCulloch

Winthrop Professor Malcolm McCulloch, Premier's Research Fellow and member of the Oceans Institute, was elected to the prestigious Royal Society.

UWA Vice-Chancellor Professor Alan Robson said Professor McCulloch's election to the Society put him alongside the leading scientists of his generation

"Professor McCulloch is a world-class researcher working in a world-class Oceans Institute at our University," Professor Robson said. "His research is helping people to recognise and confront the impact of climate change - one of the biggest challenges of our time."

Winthrop Professor Shaun Collin

Winthrop Professor Shaun Collin, Premier's Research Fellow and member of the Oceans Institute, was appointed to the Western Australian Technology and Industry Advisory Council (TIAC) by the Hon Bill Marmion, Minister for Commerce, Science and Innovation, Housing and Minister assisting the Treasurer.

Cecile Rousseau

On the 1st April 2010, climate change, whale sharks and the social impacts of climate change at Ningaloo were discussed at the Ningaloo Student Research Day.

The day was jointly led by the Department of Environment and Conservation, CSIRO's Wealth from Oceans Flagship's Ningaloo Collaboration Cluster and the Western Australian Marine Science Institution (WAMSI).

Cecile Rousseaux from The UWA Oceans Institute won the award for the

best science-based work. She spoke about the seasonal and inter-annual variation in the transport of phytoplankton offshore of Ningaloo reef.

She proved the existence of a high seasonality in the quantity and quality of food being delivered to the reef.

This research also gives a first assessment of the potential impact of climate-driven events such as El Niño on the quantity of food being delivered to the reef, which is crucial if we are to appropriately manage this new heritage listing.

Janelle Braithwaite

Janelle Braithwaite has received a \$5000 grant for Research Student Training to visit the Scottish Oceans Institute, University of St Andrews.

She will be in St Andrews for three months (April – June 2011), mainly working with Prof. Andrew Brierley on a project investigating the impact of krill harvesting on baleen whales.

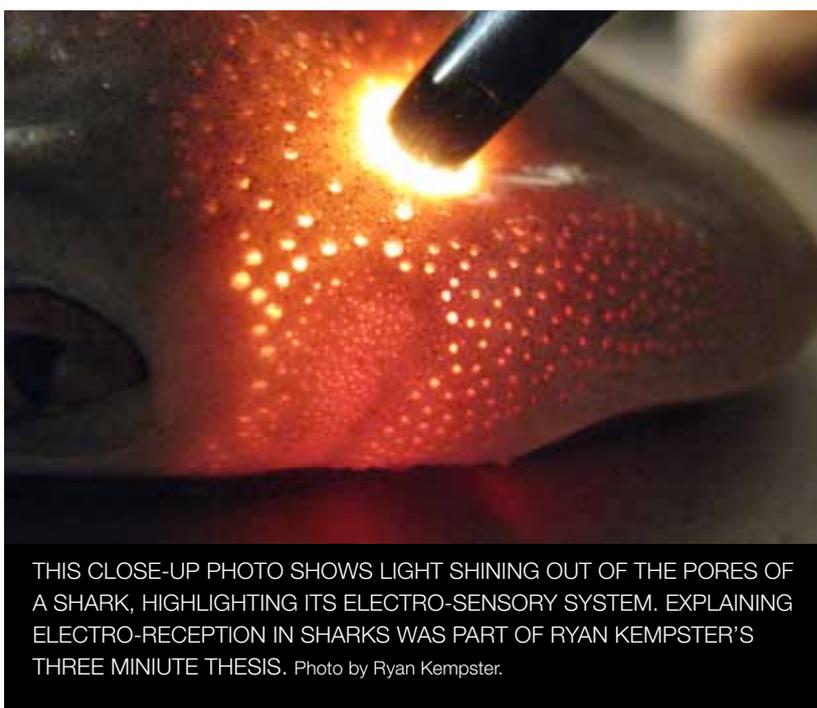
The University of St Andrews also houses the Sea Mammal Research Unit and the Research Unit for Wildlife Population Assessment (who have been developing distance sampling techniques), so whilst she is there she will also be taking the opportunity to discuss her PhD project with experts in these groups.

Janelle also won an ANNiMS mobility scholarship which enabled her to travel to the University of Tasmania for a month.

Ryan Kempster

Ryan Kempster from Animal Biology was awarded runner-up at The University of Western Australia Three Minute Thesis Competition held in July.

His presentation was titled 'The role of electro-reception in the feeding behaviour of sharks'. Ryan received a research grant of \$1000.



THIS CLOSE-UP PHOTO SHOWS LIGHT SHINING OUT OF THE PORES OF A SHARK, HIGHLIGHTING ITS ELECTRO-SENSORY SYSTEM. EXPLAINING ELECTRO-RECEPTION IN SHARKS WAS PART OF RYAN KEMPSTER'S THREE MINIUTE THESIS. Photo by Ryan Kempster.

Research, Education and Outreach

Research Seminar Series

The Oceans Institute and the Australian Institute of Marine Science (AIMS) held a successful series of research lectures presented by Oceans Institute and AIMS staff and students, collaborators and visitors at lunchtimes on Wednesdays during the year.

The following table gives details of the presenters and topics covered in 2010:

PRESENTER	UNIVERSITY/ INSTITUTE	TOPIC
James Gilmour	Australian Institute of Marine Science	Sedimentation, dredging and coral spawning
Di Watson	The University of Western Australia, Centre for Marine Futures	Fish at the Abrolhos
Brian Black		Climate change
Chari Pattiaratchi	The University of Western Australia, School of Environmental Systems Engineering	Integrated Marine Observation System (IMOS) in Western Australia
John Raven	University of Dundee	Ocean acidification
Katarina Fabricius	Australian Institute of Marine Science, Townsville	Sedimentation, turbidity and nutrient enrichment in coral reefs: the importance of local drivers at a time of global changes
Jamie Oliver	Australian Institute of Marine Science	Global patterns of coral bleaching and mortality: how robust are the observational data?
Julian Clifton	The University of Western Australia, School of Earth and Environment	People, Politics and Protection, prospects for effective marine conservation in Indonesia
Rich Evans	WA Department of Fisheries	Effects of no-take areas on the Great Barrier Reef
Ivan Haigh	The University of Western Australia, School of Environmental Systems Engineering	Past, present and future changes in sea levels around Western Australia
Gary Kendrick	The University of Western Australia, Oceans Institute	Adaptations to life in a submerged environment: evolution of reproductive and dispersal traits in seagrasses, summary of the outcomes of the WG65
Cory Bradshaw	Australian Institute of Marine Science	Relative environmental impact of the world's countries
Emmanuel Cordier	University of La Réunion	Hydrodynamic and sedimentary processes on the fringing reef at La Réunion
David Rivers	The University of Western Australia, School of Plant Biology	The effect of gaps on seagrass recolonisation dynamics and seagrass diversity
Monica Gagliano	The University of Western Australia, Oceans Institute	When the going gets tough: fishes in a changing climate
Ben Radford	Australian Institute of Marine Science	Predictive habitat mapping of deep water coral reefs using multibeam, AUV machine auto-classified data and an ecological modelling approach.
Jeremy Shaw	The University of Western Australia, Centre for Microscopy, Characterisation and Analysis	Cryo-preparation of tissue for ultrastructural Microbialisation: New opportunities in biological electron microscopy

PRESENTER	UNIVERSITY/ INSTITUTE	TOPIC
Jim Falter	The University of Western Australia, School of Earth and Environment	Climatic forcing of growth and metabolism in coral reef communities: examples from Hawaii and Ningaloo
Martin Solan	University of Aberdeen	On the contribution of benthic biodiversity to ecosystem process and functioning
Robert Ong	Fluid Dynamics Research Group, Curtin University	Development of a coupled computational fluid dynamics model for the simulation of heat transfer, spectral irradiance and fluid flow in coral structures.
Terry Done	Australian Institute of Marine Science	Change in coral communities: it's time to transform long-term monitoring into long-term ecological research
Martial Depczynski	Australian Institute of Marine Science	New insights on coral reef fish ecology and life histories
Tim Langlois	The University of Western Australia, Western Australian Marine Science Institution	Synergistic effects of multiple stressors on fish populations: evidence from the irobia niche
John Fitzpatrick	The University of Western Australia, School of Animal Biology	Sex in the sea: penis and sperm evolution in whales and fish
Dan Smale	The University of Western Australia, Western Australian Marine Science Institution	Of ice and them: ice disturbance and marine biodiversity in Antarctica
David Paterson	Sediment Ecology Research Group, Scottish Oceans Institute St Andrews University Scotland	Stromatolites, biofilms and microbial mats ecosystem engineers or stromatolites: my part in their downfall
Susana Agusti	Mediterranean Institute for Advanced Studies (IMEDEA) Mallorca, Spain	Impact of elevated UVB radiation on marine biota
Carlos Duarte	Mediterranean Institute for Advanced Studies (IMEDEA) Mallorca, Spain	The role of the oceans in the future of humanity: opportunities and challenges
Nick Graham	ARC Centre of Excellence for Coral Reef Studies, James Cook University	Extinction vulnerability, ecological thresholds and the management of coral reefs
Anthony Hart	Department of Fisheries	Environment catch predictions and integrated fisheries management: the unique case of the Perth recreational abalone fishery
Jeremy Shaw	The University of Western Australia, Centre for Microscopy, Characterisation and Analysis	The secret life of chitons (well their teeth at least!)
Brezo Martinez	Universidad Rey Juan Carlos, Madrid	Habitat model of <i>Himantalia elongata</i> : responses to a warming climate
Bec O'leary and Bec Fisher	Australian Institute of Marine Science	So how many species are there really? Expert elicitation of biodiversity on coral reefs.
Christine Schoenberg	Australian Institute of Marine Science	Bioerosion matters – coral reef carbonate cycling from the sponge point of view
Shawn Laffan	School of Biological, Earth and Environmental Sciences, University of NSW, Sydney	Biodiverse, a tool for the spatial analysis of biological and related diversity
Tamero Soomera	Head of Wave Engineering Laboratory, Institute of Cybernetics, Tallinn, Estonia	Contribution of fundamental research towards solving challenges of changing times



Photo by Heather Taylor.

Postgraduate and Postdoctoral Workshop Series

A successful postgraduate Showcase was held in April 2010 at which 35 of the 56 postgraduate students associated with the Oceans Institute (including AIMS) gave a 3 minute presentation on their research.

This was followed by a social gathering, at which students developed contacts with colleagues from other schools. Again, it is planned to hold at least one session annually. The program for the showcase was as follows:

PRESENTER	SUPERVISOR	TOPIC
Fanny de Busserolles	Prof. Shaun Collin	Myctophid vision: seeing and being seen in the mesopelagic zone.
Ashkan Rafiee	Prof. Krish Thiagarajan, Prof. J. J. Monaghan (Monash University)	Numerical and experimental study of sloshing phenomenon in marine tanks
Jonathan Ruppert	Dr Mark Meekan (AIMS), Marie-Josée Fortin (University of Toronto)	The impact of apex predator removal on the community structure of coral reef fishes
Cecile Rousseaux	Prof. Anya Waite, Assoc./Prof. Ryan Lowe and Dr Peter Thompson (CSIRO)	Production and transport of particulate matter in a regional current system adjacent to a coral fringing reef
John Statton	Dr Marion Cambridge, Prof. Kingsley Dixon, Prof. Gary Kendrick	The role of sediment nutrients and light on early seedling growth and development and their effect on translocation of seed-based propagules for restoration of seagrass (<i>Posidonia australis</i> Hook f.) in Cockburn Sound
Simone Niedermueller	Prof. Shaun Collin and Assoc./Prof. Nathan Hart	Shedding light on the evolution of the vertebrate eye: photoreceptive systems in hagfishes, lampreys and teleosts
Shari Gallop	Prof. Chari Pattiaratchi, Dr Ian Eliot (DEC)	Wave-induced sediment transport and morphodynamics on a perched beach
Samantha Childs	Prof. Gary Kendrick and Dr Dan Smale	Community structure and species interactions in marine sessile benthic communities
Hemlata Wadhwa	Prof. Krish Thiagarajan	Study of hydrodynamic coefficients of porous plates and application to subsea deployment
Soheila Taebi	Prof. Chari Pattiaratchi, Prof. Greg Ivey, Assoc./Prof. Ryan Lowe, Dr Graham Symonds (CSIRO)	Hydrodynamic processes of fringing reef systems: Ningaloo Reef, Western Australia
Jillian Ooi	Assoc./Prof. Kimberly Van Niel, Prof. Gary Kendrick	Role of sedimentary environments in driving seagrass landscapes patterns in Pulau Tinggi, Malaysia
Nitin Repalle	Prof. Krish Thiagarajan	Study of sloshing impact loads in partially filled LNG containers
Alice Gedaria	Asst/Prof. Matt Hipsey and Prof. Tony O'Donnell	Microbial trophic interactions and controls on the bloom dynamics of <i>Karlodinium veneficum</i> in the Swan River Estuary
Tao Xu	Prof. Greg Ivey, Assoc./Prof. Ryan Lowe, Prof. Chari Pattiaratchi	Transient upwelling dynamics at Ningaloo Reef

PRESENTER	SUPERVISOR	TOPIC
Conrad Speed	Dr Mark Meekan (AIMS)	Movement, feeding and behaviour of reef sharks at Ningaloo Reef, Western Australia
Cyprien Bosserelle	Prof. Chari Pattiaratchi, Dr Ivan Haigh	Hydrodynamic and sediment transport on perched beaches in Western Australia
Leonardo Ruiz Montoya	Assoc./Prof. Ryan Lowe, Assoc./Prof. Kimberly Van Niel, Prof. Gary Kendrick	The role of ocean dynamics on seagrass seed dispersal and recruitment in Western Australia
Ana Laura Ruibal	Asst/Prof. Matt Hipsey, Dr Rob Summers	Shifts in natural nutrient flux pathways in a catchment-estuarine system as a result of land use and climatic change
Dibakar Rakshit	Prof. Krish Thiagarajan, Dr Ramesh Narayanaswamy (Curtin University of Technology)	Analysis of two-phase effects in liquid sloshing
Ryan Kempster	Prof. Shaun Collin	The role of electroreception in the feeding behaviour of elasmobranchs
Lei Tian	Prof. Greg Ivey, Asst/Prof. Nicole Jones, Assoc./Prof. Ryan Lowe, Dr Richard Brinkman (AIMS)	Dynamics of topographically induced secondary circulation in shallow water: the Kimberley, WA
Janelle Braithwaite	Prof. Jessica Meeuwig, Asst/Prof. Matt Hipsey, Curt Jenner (Centre for Whale Research), Assoc./Prof. Robert McCauley (Curtin University), Prof. Gary Kendrick	Identifying critical habitats for humpback whales (<i>Megaptera novaeangliae</i>) off the NW coast of Australia
Asha de Vos	Prof. Chari Pattiaratchi	Blue whale (<i>Balaenoptera musculus</i>) populations off Sri Lanka: population status, habitat use and physical factors affecting their movements
Asamudin Rahman	Prof. Krish Thiagarajan	Vortex induced vibration of circular cylindrical structure with different aspect ratio
Alexis Espinosa	Prof. Greg Ivey, Asst/Prof. Marco Ghisalberti, Asst/Prof. Oliver Fringer (Stanford University)	Numerical study of mean and oscillating free surface flows past multiple emergent obstacles with application to complex topographical environments
Yuval Berger	Dr Mark Meekan (AIMS) and Assoc./Prof. Steve Smith (University of New England)	Vertical movement and habitat use in whale sharks (<i>Rhincodon typus</i>)
Malene Mohl	Prof. Anya Waite, Dr Nicole Patten	Picoplankton as a biological proxy for water mass origin
David Rivers	Emeritus Prof. DI Walker and Prof. Gary Kendrick	Contribution of seedling recruitment to seagrass recolonisation dynamics in gaps
Cynthia Bluteau	Asst/Prof. Nicole Jones, Prof. Greg Ivey	Boundary layer and internal wave dynamics
Ben Ford	Assoc./Prof. Euan Harvey, Prof. Jessica Meeuwig	Functional traits of Western Australian fishes
Joao Paulo Coimbra	Assoc./Prof. Nathan Hart and Prof. Shaun Collin	Vision in sea and shorebirds
Zhenlin Zhang	Assoc./Prof. Ryan Lowe, Prof. Greg Ivey, Asst/Prof. Jim Falter	Modelling nutrient dynamics in coral reef systems
Margie Mohring	Dr Thomas Wernberg (ECU) and Prof. Gary Kendrick	The reproductive ecology of <i>Ecklonia radiata</i>
Darshani Thotagamuwage	Prof. Chari Pattiaratchi	Long waves and harbor oscillations
Gabriel Vianna	Assoc./Prof. Jessica Meeuwig and Dr Mark Meekan (AIMS)	Movement patterns, population structure and socio-economical value of reef sharks in Palau, Micronesia

Research Collaboration Agreements

The UWA Oceans Institute has developed a Collaborative Research Agreement with the Australian Institute of Marine Science (AIMS).

Each party contributes to a collaborative fund to support the appointment of joint Postdoctoral Fellows.

The University of Western Australia Australian Institute of Marine Science Research Collaboration Agreement covers five years from 1 July 2009 and totals \$2.479 million.

In 2010, Fellowships were awarded to Dr Sam Kelly from the College of Oceans and Atmospheric Sciences at Oregon State University; Dr Michele Thums, from the University of Tasmania; and Dr Jens Zinke, from the Nederlands Instituut voor Onderzoek der Zee (NIOZ).

Building on this, the Oceans Institute signed a Letter of Intent to develop a strategic relationship in oceans research with CSIRO and in August 2010 AIMS, CSIRO and The University of Western Australia agreed to extend the Collaborative Research Agreement between AIMS and the Oceans Institute for the purpose of funding joint postdoctoral salaries.

A research day with the three organisations was held in November, at which the research areas in which the three organisations agreed to collaborate were identified.

A further round of Postdoctoral Fellowships in these research areas will be advertised early in 2011.

University Extension Series with AIMS

In order to acknowledge the United Nations International Year of Biodiversity, a series of three lectures entitled 'The State of the Oceans in the Year of Biodiversity' was held in August in conjunction with The UWA Extension Service.

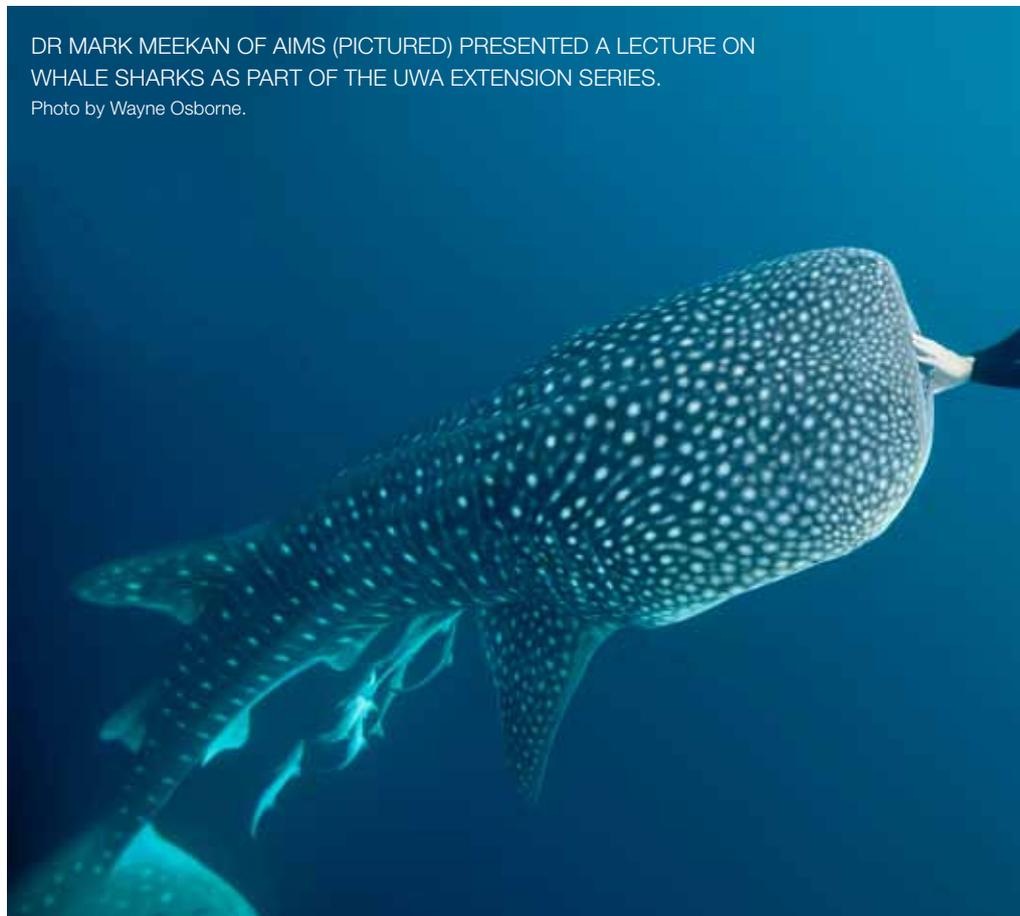
The series was attended by members of the academic and general community.

The series comprised the following lectures:

- 'Western Australia-a biodiversity hotspot for both seaweeds and seagrasses', presented by Prof. Gary Kendrick from The UWA Oceans Institute.
- 'Coral Reefs-will they survive climate change?', presented by Prof. Malcolm McCulloch from The UWA Oceans Institute.
- 'Tagging and tracking the world's largest fish', presented by Dr Mark Meekan from AIMS.

DR MARK MEEKAN OF AIMS (PICTURED) PRESENTED A LECTURE ON WHALE SHARKS AS PART OF THE UWA EXTENSION SERIES.

Photo by Wayne Osborne.



Culture Building

In order to facilitate the development of a distinctive Oceans Institute culture, the Executive developed a series of Culture and Resilience Sessions for staff and students during the year.

Sessions were well attended, and feedback was positive.

The Oceans Institute also established a panel of coaches, and offered members the opportunity to consult with coaches about issues outside of their academic program.



Outreach Sessions

An outreach program was developed during 2010 to introduce the Oceans Institute and the research being undertaken by its members to key stakeholders.

At each meeting, key Oceans Institute staff gave short presentations to demonstrate the breadth and interdisciplinary nature of the research being undertaken.

During 2010, lunchtime meetings were held with:

- WA Chief Scientist, Professor Lyn Beazley
- Chairman of AIMS Council, Wayne Osborn, CEO Dr Ian Poiner and Science Leader WA Jamie Oliver
- Professor Neil Loneragan from Murdoch University; Dr Paul Lavery from Edith Cowan University; Bernard Bowen, former Chair of WAMSI; Dr Tom Hatton, Director Wealth from Oceans Flagship CSIRO; Rob Edkins CEO South Coast NRM
- Dr Carmen Lawrence, University of Western Australia and
- Dr Michael Chaney, Chancellor of The University of Western Australia.

The meetings gave the Oceans Institute members the opportunity not only to showcase their research but to discuss research opportunities outside of their normal network.

Career Preparation and Writing Workshops

Following on from the postgraduate Showcase, a series of workshops for postgraduates and early career academics was devised.

The topics covered included 'Building a Track Record in Research', 'Strategic writing for high quality journals', 'Preparing applications for ARC Linkage and other grants' and 'Mentoring'.

This series has been presented by UWA staff, primarily members of the Research Development Office, with whom a strong relationship has been developed.

Additionally, a four-day workshop over four weeks, presented by Emeritus Professor David Lindsay, who has published two books on the topic, was offered to 10 postgraduates and postdoctorates to assist them with writing a paper for which they had developed an outline and had the data available.

It is intended that this program be repeated annually, as an integral part of the Oceans Institute's support for postgraduate students.

Worldwide Universities Network

The University of Western Australia is a member of the Worldwide Universities Network (WUN), which is made up of 16 member universities from across four continents.

OI members have strong connections with marine research institutions in a number of member universities, and in 2010 were successful in winning the following grants from the WUN Research Development Fund:

Global patterns of climate adaption in kelps

Principle Investigator:

- Dr Thomas Wernberg, School of Plant Biology and Oceans Institute

WUN partners:

- Dr Thomas Wernberg and Prof. Gary Kendrick, University of Western Australia
- Professor John Bolton and Associate Professor Rob Anderson, University of Cape Town, South Africa
- Associate Professor Inga Kjersti Sjøtun, University of Bergen, Norway.



Photo courtesy of Gary Kendrick.

WUN collaborations on ocean acidification

Principle Investigator:

Professor James Murray, University of Washington

WUN partners:

- James W. Murray, Terrie Klinger, University of Washington
- Jorun Egge, Richard Bellerby, University of Bergen
- Toby Tyrell, University of Southampton
- Malcolm McCulloch, University of Western Australia
- Andy Ridgwell, Bristol University
- Roland Kroeger, York University
- Lee Kump, Penn State University.

External Delegations Hosted

During 2010 The Oceans Institute hosted delegations from:

- Institute 'ICOFFSHORE', HUCE, Vietnam, sponsored by Professor Krish Thiagarajan
- The Ministry of Indonesian Foreign Affairs, Jakarta, Indonesia which included the Head of the Indian Ocean Study Centre, Andalas University, sponsored by Dr Dennis Rumley and Dr Viv Forbes
- Dr Gangjian Wei, Chinese Academy of Sciences, Guangzhou Institute of Geochemistry, China, sponsored by W/Professor Malcolm McCulloch
- Australian Academy of Science 2010 UK-Australia Frontiers of Science Marine Meeting
- WA Secondary School Science Teachers Marine Diversity Professional Development Day, a SPICE initiative.

International Visits

Six PhD students and four postdoctoral researchers from the Oceans Institute attended the Physics of Estuaries and Coastal Seas (PECS) conference in Sri Lanka during the year.

The conference focused on the theme of 'Coastal and Estuarine Observations and Modelling' and was chaired by Winthrop Professor Chari Pattiaratchi, of the Oceans Institute and Head of the School of Environmental Systems Engineering.

The emphasis on modelling reflects the work being undertaken by this group in climate change and sea level rise on estuaries and coastal seas.

Winthrop Professor Shaun P. Collin, Ms Fanny de Busserolles (PhD student) and Ms Caroline Kerr (Research Associate) took part in a deep sea research expedition in September 2010 on board the German Research Vessel, the 'Sonne'.

This research cruise focused on 'Bioluminescence and Vision' was trawling the Peru-Chile Trench off South America down to depths of 1,700m to investigate the neurobiological drivers of circadian migration of lantern fishes up and down the water column, the limits of vision in the deep sea and eye design in fishes that use bioluminescent signals for feeding, predator avoidance and reproduction.

Professor Anya Waite and the Pro Vice-Chancellor (Research) Professor Alistar Robertson visited the University of Cape Town in November.

The aim was to identify potential areas for strategic research engagements. Oceans Sciences and Global Change and Adaption to Climate Change were nominated as areas in which to advance collaborations.

It is planned to establish a joint fund to be used over the next two years to facilitate activities and to review progress at that time.

Prof. Roberston also visted the University of Southhampton, another WUN member, to develop stronger partnerships.



OCEANOGRAPHERS FROM THE OCEANS INSTITUTE PRESENTED THEIR WORK AT THE PHYSICS OF ESTUARIES AND COASTAL SEAS CONFERENCE IN COLOMBO, SRI LANKA. Photo by Yasha Hetzel.



Photo courtesy of Gary Kendrick.

ANNiMS

OI members contribute to the Australian National Network in Marine Science (ANNiMS), which is a collaboration between James Cook University, the University of Tasmania and The University of Western Australia, funded under the Diversity and Structural Adjustment Fund, through the Department of Education Employment and Workplace Relations.

In March, Professors Anya Waite of the OI and Tom Trull (University of Tasmania) ran a two-week student training voyage, sponsored by ANNiMS, in biological and geochemical oceanography on the Australian Marine National Facility, the RV Southern Surveyor. Fourteen postgraduate and honours students across Australia, including OI members, were selected through a national competition to undertake the voyage. It introduced them to the fundamentals of shipboard oceanographic sampling, including both the science of oceanography, and the operational aspects of being at sea and deploying sampling gear.

A coastal engineering short course which was held in Perth in June 2010 and attended by OI students who were funded by ANNiMS.

The three-day intensive coastal engineering short course aimed to instil a broad understanding of the various parts of marine design and construction operations.

These included wave theory, wave hind casting, water level variability, coastal geomorphology, sediment transport, coastal protection, coastal management, coastal structures, port optimisation, port planning and development, small craft facilities and coastal and floating structures

A number of UWA students associated with the OI have been beneficiaries of ANNiMS travel grants, scholarships, the PhD mobility program and internships, allowing them to attend conferences and short courses or a full semester in one of the partner universities during the year.

In September, 20 PhD and Honours students from the Oceans Institute attended the fully-funded conference titled 'Marine Science in Tropical, Temperate and Southern Oceans' at James Cook University, Townsville.

A number of OI members have also been successful in the Springboard Research Program which aims to achieve collaboration on a research project between two or more of the partner institutions with funding up to \$30,000 (see Research Grants on p30).

Additionally, OI researchers were successful in winning research grants offered by ANNiMS (see p30) and the OI hosted a number of ANNiMS Visiting Fellows during the year, as outlined in Visiting Fellows section (see p20).

WAMSI

The University of Western Australian is a member of the Western Australian Marine Science Institution (WAMSI), with OI members working as scientific collaborators in a number of WAMSI nodes.

External meetings have been held with the WAMSI Chair and Chief Executive Officer, and the Director attended a meeting between WAMSI and the WA Minister for the Environment to discuss further funding at the end of WAMSI 1.

Oceans Institute members attended the WAMSI annual Show and Tell and a number of Oceans Institute postgraduates presented at the WAMSI's Young Career Researcher Symposium held in November 2010.

In May, the General Manager visited the Sydney Institute of Marine Science and met with the Director, Professor Peter Steinberg, and the Chief Operating Officer.

In early October, the Acting Director attended the Peel Harvey quantitative modelling workshop.

In October, the Acting Director attended the NCCARF marine science adaptation, a three-day workshop in Byron Bay.

In November, the Acting Director attended the Effects of Fishing Advisory Group meeting at Hillarys WA.

As WAMSI 1 comes to an end in 2011, OI members have also been working with WAMSI partners with a view to attracting funding to continue WAMSI and extend strategic research in the Northwest.

WAIMOS

Western Australian Intergrated Marine Observation System (WAIMOS)

The West Australian node for the Intergrated Marine Observing System (IMOS) is the West Australian Intergrated Marine Observation System (WAIMOS), led by OI Winthrop Professor Chari Pattiaratchi. OI members contributed to planning to extend the funding of IMOS which is party to the international oceans observing systems.

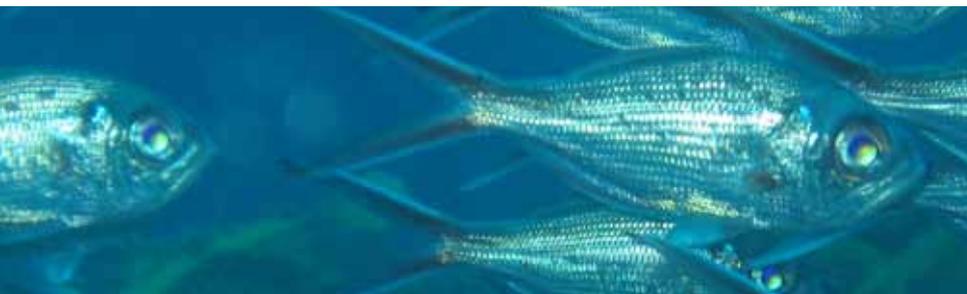
It is anticipated that these bids will be successful in 2011.

Collaborating Organisations

The Oceans Institute collaborates with the following organisations:

Australian Institute of Marine Science
Department of the Environment, Water, Heritage and the Arts
Edith Cowan University
CSIRO Marine Research
Curtin University
Intergovernmental Oceanographic Commission
Mediterranean Institute for Advanced Studies
Murdoch University
National Environmental Research Institute, Denmark
SA Herbarium, Adelaide
Scripps Institution of Oceanography
Stanford University
Universidad Rey Juan Carlos
University of Adelaide
University of British Columbia
University of Cape Town
University of Hawaii
University of Las Palmas de Grand Canaria (Spain)
University of New South Wales
University of Southampton
University of Southern Denmark
University of Washington
WA Department of Planning and Infrastructure
WA Department of Fisheries
WA Museum
WA Department of Environment and Conservation.
Western Australian Marine Science Institution

International and National Engagement



Visiting Fellows

The Oceans Institute hosted a number of visiting academics during 2010.

NAME	VISITOR ORIGIN AND COUNTRY	RESEARCH SUBJECT	HOST	DATES
Dr Sophie Arnaud-Haond and Tania Aires	University of Montpellier II, France and Marine Ecology and Evolution Group CCMAR Faro Portugal	Seagrass genetics	Gary Kendrick	30 Jan – 10 Feb
Prof. Russell Foster	Department of Ophthalmology, University of Oxford, UK	Non-visual photoreception and circadian rhythms	Shaun Collin	23 Mar – 6 April
Professor David Prandle, ANNiMS Fellow	University of Wales, School of Ocean Science, Bangor, UK	Estuarine systems	Chari Pattiaratchi	24 Mar – 2 June
Prof. Menno Gerkema	Zoology Laboratory, University of Groningen, Netherlands	Behavioural chronobiology	Shaun Collin	6 – 23 April
Dr Ana Metaxas	Dalhousie University	Larval ecology of marine benthic invertebrates, Larval production, dispersal and recruitment of invertebrates and structure of macro- and megabenthos at hydrothermal vents	Anya Waite	April – May
Dr Steve Schill	The Nature Conservancy, USA	Protecting Nature, Preserving Life: The Nature Conservancy in the Caribbean	Bryan Boruff	7 – 19 May
Indonesian delegation	Indonesia	Indian Ocean Research Group	Dennis Rumley	18 May
Professor Martin Solan, ANNiMS Fellow	The University of Aberdeen, Scotland	Species interactions, macroinvertebrate bioturbation and the development of concepts of biodiversity and ecosystem function in marine sediment systems	Chari Pattiaratchi	9 – 20 Aug
Professor David Paterson, ANNiMS Fellow	University of St Andrews, Scotland	Biodiversity, functional ecology and dynamics of coastal systems	Chari Pattiaratchi	6 Sept – 6 Oct
Ms Aurora Garotte	University of Alicante, Spain	Effects of salinity on seagrasses	Marion Cambridge	9 Sept – 18 Dec
Dr Brezo Martinez	Universidad Rey Juan Carlos, Madrid, Spain.	Coastal species biogeography and forecast changes in response to the warming	Thomas Wernberg	1 Oct – 31 Dec

NAME	VISITOR ORIGIN AND COUNTRY	RESEARCH SUBJECT	HOST	DATES
Professor Carlos Duarte	IMEDEA, Spain	The role of the oceans in the future of humanity: opportunities and challenges	Vice Chancellor	2 – 7 Oct
Professor Susana Agusti	IMEDEA, Spain	Impact of elevated UVB radiation on marine biota	Prof. Alistar Robertson	2 – 7 Oct
Science Teachers PD Day	WA High Schools	A SPICE initiative	Gary Kendrick	7 Oct
Australian Academy of Science	UK and Australia		Gary Kendrick	12 October
Professor Michael Collins, Gledden Fellow	University of Southampton	Sediment dynamics	Chari Pattiaratchi	19 Oct – 12 Nov
Dr Susan Theiss	University of Queensland	Visual ecology in wobbegong sharks	Shaun Collin and David Hunt	27 Nov – 16 Dec
Associate Professor Ron Johnston	University of Queensland	SEMAT monitoring system	Shaun Collin	17 – 19 Aug
Professor Julian Partridge	University of Bristol	Polarisation signals in nature	Shaun Collin and Nathan Hart	6 – 20 Dec
Dr Lars Schmidt	University of California Davis	Visual ecology in wrasses	Shaun Collin	9 Dec – 30 Mar
Professor Trevor Lamb FRS	Australian National University	Eye evolution in vertebrates	Shaun Collin	4 Nov
Dr Shawn Laffan	School of Biological, Earth and Environmental Sciences UNSW, Sydney	Biodiverse, a tool for the spatial analysis of biological and related diversity	Kimberly Van Niel	16 – 26 Nov
Dr Alecia Bellgrove	Deakin University	Macro algae	Gary Kendrick	22 – 29 Nov
Prof. Tarmo Soomera, ANNiMS fellow	Tallinn University of Technology, Estonia	Patterns of changes to the regional wave climate	Chari Pattiaratchi, Gary Kendrick	23 – 29 Nov
Jonne and Helen Kotta, Maerle Parnoja	Estonia Marine Institute	Benthic ecology	Anya Waite	5 Dec – 2 Feb



Media Reports

During the year, the number of articles and interviews mentioning The UWA Oceans Institute were as follows:

THE UWA OCEANS INSTITUTE MEDIA REPORTS	
NEWSPAPER	NUMBER of ARTICLES
Perth and Regional	13
Community Newspapers	10
National	3
Others	2
TELEVISION	NUMBER of INTERVIEWS
ABC	1
Commercial	3
RADIO	NUMBER of INTERVIEWS
ABC National	9
ABC WA Regional	20
ABC Perth	7
Commercial	1
WEBSITES	NUMBER of MEDIA RELEASES
CSIRO	1
Science Network WA	9
Others	2
TOTAL MEDIA REPORTS	81



OI Newsletters

During 2010, three Newsletters detailing significant events, research findings, awards received and other statistics, were published for distribution amongst the marine research community as well as for use as a marketing tool. It is planned to publish the newsletter each quarter.

Newsroom Articles

A total of 39 web articles containing references to The UWA Oceans Institute were uploaded to The UWA Newsroom.



Photo courtesy of Shaun Collin.

A STUDY ON COLOUR BLINDNESS IN SHARKS INVOLVING ASSOC./PROF. NATHAN HART FROM THE OCEANS INSTITUTE RECEIVED WIDESPREAD MEDIA COVERAGE, FEATURING ON THE BBC'S WEBSITE.

Oceans Institute Staff and Members

List of Staff

NAME	POSITION
W/Prof. Gary Kendrick	Director
Ms Christine Shervington	General Manager
Ms Maryann Evetts	Executive Assistant
Ms Sueli Amprino	Administrative Officer (P-T)

List of Members

NAME	POSITION
W/Prof. Mark Cassidy	Director, Centre for Offshore Engineering (COFS)
W/Prof. Shaun Collin	Premier's Research Fellow
Assoc./Prof. Euan Harvey	Associate Professor
W/Prof. Greg Ivey	Winthrop Professor
Prof. Malcolm McCulloch	Premier's Research Fellow
Prof. Jessica Meeuwig	Research Professor
W/Prof. Charitha Pattiaratchi	Winthrop Professor
Prof. Krish Thiagarajan	Professorial Fellow/Research Theme Leader (Marine and Subsea)
Prof. Anya Waite	Professor
Dr Anne Brearley	Honorary Research Fellow
Asst/Prof. Bryan Boruff	Assistant Professor
Prof. Michael Burton	Professor
Dr Marion Cambridge	Honorary Research Fellow
Assoc./Prof. Peta Clode	Associate Professor
Dr Selvi Dev	Research Associate
Dr Delphine Dissard	Research Associate
Asst/Prof. Jim Falter	Research Assistant Professor
Dr John Fitzpatrick	Postdoctoral Research Fellow
Dr Monica Gagliano	Postdoctoral Research Fellow
Prof. Christophe Gaudin	Professorial Fellow

NAME	POSITION
Miss Ruth Gongora-Mesas	Personal Assistant, SESE
Mr Alexander Grochowski	Research Officer
Dr Ivan Haigh	Research Associate
Assoc./Prof. Atakelty Hailu	Associate Professor
Asst/Prof. Christine Hanson	Research Assistant Professor
Assoc./Prof. Nathan Hart	Research Associate Professor
Asst/Prof. James Hengesh	Research Assistant Professor
Asst/Prof. Matt Hipsey	Research Assistant Professor
Mr Ben Hollings	Research Associate



BIOLOGICAL AND PHYSICAL OCEANOGRAPHERS FROM THE OCEANS INSTITUTE TEAMED UP WITH THE CSIRO TO STUDY WINTERTIME CONTINENTAL SLOPE AND SHELF PROCESSES ALONG SOUTHWEST WA.

Photo courtesy of Yasha Hetzel.

NAME	POSITION
Dr Renae Hovey	Postdoctoral Research Fellow
W/Prof. David Hunt	Winthrop Professor
Asst/Prof. Nicole Jones	Assistant Professor
Ms Caroline Kerr	Research Associate
Assoc./Prof. Ryan Lowe	Associate Professor
Asst/Prof. Nicola Mitchell	Assistant Professor
W/Prof. David Pannell	Winthrop Professor
Mr Antony Payne	Research Assistant
Mr Ben Piek	Research Officer

NAME	POSITION
Asst/Prof. Christin Sawstrom	Research Assistant Professor
Mr Dennis Stanley	Glider Technician
Assoc./Prof. David Sutton	Associate Professor
Assoc./Prof. Kimberly van Niel	Associate Professor
Asst/Prof. Flo Verspecht-Kaempf	Research Assistant Professor
Dr Thomas Wernberg	Postdoctoral Research Fellow
Dr Sarath Wijeratne	Research Associate
Asst/Prof. Lai Mun Woo	Research Assistant Professor



Oceans Institute PhD and MSc Students

NAME	SUPERVISOR/S	FACULTY	SCHOOL	PhD TITLE
Asamudin A Rahman	Krish Thiagarajan	FECM	Mechanical Engineering	Vortex induced vibration of circular cylindrical structure with different aspect ratio
Rachel Binks	Jane Prince, Jason Kennington, Jon Evans	FNAS	Animal Biology	Reproductive and genetic ecology of the Australian sea urchin <i>Heliocidaris erythrogramma</i> (Valenciennes 1846)
Cynthia Bluteau	Greg Ivey and Nicole Jones	FECM	Environmental Systems Engineering	Benthic boundary layer dynamics and internal wave climatology
Cyprien Bosserelle	Chari Pattiaratchi, Ivan Haigh	FECM	Environmental Systems Engineering	Hydrodynamic and sediment transport on perched beaches in Western Australia
Janelle Braithewaite	J Meeuwig, M Hipsey, C Jenner, R McCauley	FNAS	Animal Biology	Identifying critical cetacean habitats for humpback whales off the northwest coast of Aus.
Napo Cayabyab	Ryan Lowe, Jim Falter, Gary Kendrick, Andrew Heyward (AIMS)	FNAS	SEE/PB	Physiological response, nutrient allocation, and growth of seagrasses to varying levels of pCO_2 along a latitudinal gradient in Western Australia
Samantha Childs	Gary Kendrick, Dan Smale, David Sutton	FNAS	Plant Biology	Benthic community dynamics across spatial scales and contrasting systems
Jock Clough	Jessica Meeuwig, Euan Harvey	FNAS	Plant Biology	The structure of demersal fish assemblages of South Passage and Blind Strait, Shark Bay
Joao Paulo Coimbra	Nathan Hart and Shaun Collin	FNAS	Animal Biology	Vision and retinal topography in birds and mammals
Fanny de Busserolles	Shaun Collin (UWA), Justin Marshall (QBI, University of Queensland)	FNAS	Animal Biology	Myctophid vision: seeing and being seen in the mesopelagic zone.
Asha de Vos	Chari Pattiaratchi and Robert Harcourt (Macquarie)	FECM	Environmental Systems Engineering	Factors influencing aggregations of blue whales off southern Sri Lanka
Alexis Espinosa	Greg Ivey, Marco Ghisalberti, Nicole Jones and Oliver Fringer (Stanford)	FECM	Environmental Systems Engineering	Oscillating environmental flows in complex topography
Ben Ford	Euan Harvey, Howard Choat (James Cook University), Marti Anderson	FNAS	Plant Biology	Functional ecology of West Australian marine fish
Shari Gallop	Chari Pattiaratchi and Ian Eliot (DEC)	FECM	Environmental Systems Engineering	Wave-induced sediment transport and morphodynamics on a perched beach
Eduardo Garza Gisholt	Shaun Collin and Nathan Hart	FNAS	Animal Biology	Vision and light detection in Chondrichthyans
Alice Gedaria	Matthew Hipsey, Tony O'Donnell	FNAS	Earth and Environment	Microbial trophic interactions and controls on the bloom dynamics of <i>Karlodinium veneficum</i> in the Swan River Estuary.

NAME	SUPERVISOR/S	FACULTY	SCHOOL	PhD TITLE
Yasha Hetzel	Chari Pattiaratchi, Ryan Lowe	FECM	Environmental Systems Engineering	Dynamics of ocean exchange and larval dispersal in Shark Bay, Australia
Saskia Hinrichs	Anya Waite, Nicole Patten, Carolyn Oldham, Ming Feng, Athanasios Vafeidis	FECM	Environmental Systems Engineering	Impacts of hydrodynamic shifts on coral condition at Ningaloo Reef
Shahab Hosseini	Greg Ivey, Ryan Lowe	FECM	Environmental Systems Engineering	Ocean response to tropical cyclones on Australia's Northwest Shelf
Muhammad Kamarudin	Krish Thiagarajan	FECM	Environmental Systems Engineering	Added mass effects on synchronised mechanisms of VIV
Ryan Kempster	Shaun Collin, Nathan Hart	FNAS	Animal Biology	The role of electroreception in the feeding behaviour of elasmobranchs
Steve Lindfield	Euan Harvey, Jenny McIlwain (University of Guam)	FNAS	Plant Biology	The effects of marine protected areas in Guam spatial distribution of reef fishes and fish habitat associations, the effects of spearfishing on reef fish assemblages.
Carlos Salas	Shaun P. Collin and Nathan Hart	FNAS	Animal Biology	Visual processing in jawless fishes
Yu Li	Matthew Hipsey, Anya Waite and Sasha Jenkins	FNAS	Earth and Environment	Unravelling microbial interactions in aquatic ecosystems: an improved model of microbial controls on nutrient processing
Malene Mohl	Nicole Patten and Anya Waite in association with University of Southern Denmark	FECM	Environmental Systems Engineering	Picophytoplankton as biological proxy for water masses - masters thesis
Margie Mohring	Thomas Wernberg and Gary Kendrick	FNAS	Plant Biology	The reproductive ecology of <i>Ecklonia radiata</i>
Leonardo Ruiz Montoya	Ryan Lowe, Kimberly Van Niel, Gary Kendrick	FNAS	Earth and Environment / Plant Biology	Hydrodynamics of seed dispersal in temperate Australian seagrasses
Simone Neidermüller	Shaun Collin and Nathan Hart	FNAS	Animal Biology	Shedding light on the evolution of the vertebrate eye: photoreceptive systems in hagfishes, lampreys and teleosts
Amy Newman	Shaun Collin (UWA) and Justin Marshall (UQ)	FNAS	Animal Biology	The sensory systems of deep-sea sharks with an emphasis on visual capabilities
Jillian Ooi	Gary Kendrick and Kimberly Van Niel	FNAS	Earth and Environment / Plant Biology	The role of sedimentary environments in driving seagrass landscape patterns



Photo courtesy of Gary Kendrick.

Oceans Institute PhD and MSc Students

NAME	SUPERVISOR/S	FACULTY	SCHOOL	PhD TITLE
Dan Paraska	Matthew Hipsey, Ursula Salmon and Andrew Rate	FNAS	Earth and Environment	Environmental controls on chemical interactions at the sediment-water interface
Fiona Paterson	Greg Ivey, Chari Pattiaratchi	FECM	Environmental Systems Engineering	Adequacy of wave theories to describe water particle motion in shallow water
Ashkan Rafiee	Krish Thiagarajan, J. J. Monaghan (Monash University)	FECM	Mechanical Engineering	Numerical and experimental study of sloshing phenomenon in marine tanks
Dibakar Rakshit	Krish Thiagarajan and Ramesh Narayanaswamy (Curtin University)	FECM	Mechanical Engineering	Thermodynamic aspects of sloshing flows
Matthew Rayson	Greg Ivey, Nicole Jones, Michael Meuleners and Geoff Wake	FECM	Environmental Systems Engineering	Ocean circulation, Browse Basin
Nitin Repalle	Krish Thiagarajan, Murali Kantharaj	FECM	Mechanical Engineering	Study of sloshing impact loads in partially filled containers
David Rivers	Di Walker and Gary Kendrick	FNAS	Plant Biology	Seagrass colonisation into gaps in meadows: the role of seedling recruitment
Cecile Rousseaux	Anya M. Waite, Ryan Lowe, Peter A. Thompson	FECM	Environmental Systems Engineering	Oceanographic forcing of phytoplankton dynamics in the waters off north Western Australia
Ana Laura Ruibal	Matt Hipsey, Rob Summers	FNAS	Earth and Environment	Shifts in natural nutrient flux pathways in a catchment-estuarine system as a result of land use and climatic change
Ben Saunders	Euan Harvey and Gary Kendrick	FNAS	Plant Biology	Spatial distributions of <i>Parma McCullochi</i> , grazing behaviour and the effects of grazing on kelp beds in Western Australia
John Statton	Marion Cambridge, Kingsley Dixon, Gary Kendrick	FNAS	Plant Biology	The role of sediment nutrients and light on early seedling growth and development and their effect on translocation of seed-based propagules for restoration of seagrass (<i>Posidonia australis</i> Hook f.) in Cockburn Sound
Soheila Taebi	Chari Pattiaratchi, Ryan Lowe, Greg Ivey, Graham Symonds	FECM	Environmental Systems Engineering	Hydrodynamic processes of fringing reef systems: Ningaloo Reef, Western Australia
Lei Tan	Greg Ivey, Nicole Jones, Ryan Lowe, Richard Brinkman (AIMS)	FECM	Environmental Systems Engineering	Dynamics of topographically induced secondary circulation in shallow water: the Kimberley, WA
Darshani Thotagamuwage	Chari Pattiaratchi	FECM	Environmental Systems Engineering	The role of infragravity waves on harbour oscillations

NAME	SUPERVISOR/S	FACULTY	SCHOOL	PhD TITLE
Paul Van Gastel	Greg Ivey, Nicole Jones	FECM	Environmental Systems Engineering	Internal waves on Australian North West shelf
Gabriel Vianna	Jessica Meeuwig and Mark Meekan	FNAS	Plant Biology	Socio-economy and spatial ecology of reef sharks in Palau, Micronesia
Hemlata Wadhwa	Krish Thiagarajn and Bernard Molin	FECM	Mechanical Engineering	Subsea installation - hydrodynamics
Thisara Welhena	Chari Pattiaratchi, Ming Feng	FECM	Environmental Systems Engineering	Continental shelf processes
Kirrily White	Gary Kendrick, Mark Westera	FNAS	Plant Biology	Fish grading in seagrasses, Geographe Bay
Alex Wyatt	Anya Waite	FECM	Environmental Systems Engineering	Oceanographic ecology of coral reefs: the role of oceanographic processes in reef-level biogeochemistry and trophic ecology
Jiangtao Xu	Greg Ivey, Ryan Lowe, Chari Pattiaratchi	FECM	Environmental Systems Engineering	The dynamics of the Ningaloo current system
Zhenlin Zhang	Ryan Lowe, Greg Ivey	FNAS	Earth and Environment	The dynamics of the Ningaloo current system
Jamie Tedeschi	Nicola Mitchell	FNAS	Animal Biology	Are marine turtle embryos resilient to temperature extremes?
Adrian Ferguson	Euan Harvey, Nathan Knott (Parks Authority, Jervis Bay Marine Park, NSW)	FNAS	Plant Biology	Quantifying ecosystem function in marine protected areas: grazing by herbivorous fishes on temperate Australian rocky reefs
Julia Santa Garcon	Euan Harvey, Steve Newman (Department of Fisheries WA)	FNAS	Plant Biology	The development and validation of mid-water baited video technique for investigating spatial patterns and human impacts on pelagic fishes
Ben Fitzpatrick	Euan Harvey, Russ Babcock (CSIRO), Andrew Heyward (AIMS)	FNAS	Plant Biology	The effect of marine protected areas at Ningaloo on reef fish, fish and fish habitat relationships and seasonality in distributions, cross-shelf patterns in fish assemblage distribution



Photo courtesy of Gary Kendrick.

Research Grants Awarded in 2010

TITLE	FUNDING PERIOD	FUNDING BODY	AMOUNT	SUPERVISORS
Ocean–reef interactions as drivers of continental shelf productivity in a changing climate	2010-2011	ARC Discovery Grant	\$503,000	Waite A, Roughan, Kotta, Orav-Kotta, Pattiaratchi C B
Australian National Facility for Ocean Gliders	2010	University of Tasmania ex Commonwealth Government Education Investment Fund	\$1,500,000	Pattiaratchi C B
Exmouth Plateau/Great Gorgon	2009 - 2012	SERPENT	\$154,000	Pattiaratchi C B
Transient coastal upwelling along Western Australia: the dynamics of the Ningaloo current system	2009 - 2011	ARC Discovery Grant	\$360,000	Pattiaratchi C B, Ivey G, Lowe R
Deployment of oceans gliders as part of the West Australian intergrated marine observation system	2009 - 2011	Western Australian Marine Science Institution	\$100,000	Pattiaratchi C B
Offshore and coastal engineering and the effects of climate change	2008 - 2011	Western Australian Marine Science Institution	\$400,000	Pattiaratchi C B
Port Geographe sediment modelling	2010	Department of Transport, WA	\$58,000	Pattiaratchi C B
Sea level exceedance probabilities for Australia	2010	Antarctic Climate and Ecosystems Co-operative Research Centre	\$63,000	Pattiaratchi, C B in conjunction with Dr Ivan Haig
21st century changes in extreme sea levels around Australia and the UK	2010 - 2011	UWA Research Collaboration Awards	\$25,600	Haig I, Pattiaratchi C B
New Insights from Ocean Gliders - Comparing Oceanographic Forcing of Phytoplankton Dynamics in Two very different Eastern Boundary Current Regions	2010 - 2011	UWA Research Collaboration Awards	\$14,425	Hanson C, Pattiaratchi C B
Establishing genetic guidelines for the effective ecological restoration of seagrass meadows	2010	ARC Linkage Project	\$272,000	Kendrick G in conjunction with Krauss, Dixon, Waycott
Shark Bay - effects of rising water levels on the faure sill and stro-matolites	2010-2011	Caring for our Country	\$700,000	Kendrick G, Walker D in conjunction with Blake, Kendrick, Collins, Vanderklift, Fearn, Lynch

TITLE	FUNDING PERIOD	FUNDING BODY	AMOUNT	SUPERVISORS
In-vivo multispectral and X-ray micro-CT Imaging: founding a Western Australian small animal imaging core facility	2010	LIEF Grant	\$450,000	Sampson D D, Clode P L, Collin S P, et al
Advanced geochemical facility for climate and environmental change research: a West Australian–Indian Ocean focus	2010	ARC Linkage, Infrastructure, Equipment and Facilities	\$700,000	McCulloch M, et al
Purchase of a surgical microscope and electroporator	2010	NH&MRC Equipment Grant	\$30,000	Harvey A, Plant G, Collin S P, Rodger J, Dunlop S A, Fitzgerald L, Grounds M, Hodgetts S, Hool L, Mark P, Muhling J, Mulders H, Sherrard R, Shavlakadze T, Waddell B
Evolutionary shifts in vertebrate visual ecology and visual system morphology	2009 - 2011	National Evolutionary Synthesis Centre (NASCent) Collaborative Grant USA	\$140,000	Collin S P
Sensory strategies for protecting endangered sawfish	2009 - 2010	ARC Linkage Project	\$84,000	Collin S P
Sensory biology and prey manipulation behaviour of sawfish	2008 - 2010	Sea World	\$18,000	Collin S P
Seeing without eyes: the evolution of non-visual photoreceptors in vertebrates	2009 - 2011	ARC Discovery Project	\$345,000	Collin S P
Alternate diets for a sustainable aquaculture industry: neuroethology of feeding in barramundi	2008 - 2010	ARC Linkage Project	\$201,000	Collin S P
Hydrodynamic-biochemical modelling studies for the environmental impact assessment of seawater flooding in Lower Lake, South Australia	2009 - 2010	South Australian Government	\$247,000	Hipsey M
Ocean acidification and environmental change across a widening tropical-subtropical gradient	2010-2013	CSIRO Flagship Collaboration Fund (2010-13)	\$199,000	McCulloch M, Falter J, Lowe R, Trotter J
SHARC: Southern Hemisphere Algal Research Coalition	2010	UWA Research Collaboration Award	\$17,000	Wernberg T, Kendrick G, Bolton J, Anderson R

Research Grants Awarded in 2010

TITLE	FUNDING PERIOD	FUNDING BODY	AMOUNT	SUPERVISORS
Multiphoton confocal microscope for high speed, deep tissue imaging and multimodal nanoscale characterisation	2010-2011	ARC Linage, Infrastructure, Equipment and Facilities Grant	\$500,000	Collin S P, Raston C L, Sampson D D, Whelan J M, Dunlop S A., Martins R N, Verdile G, Ogden M I, Watson C R, Li Q, Lou X, Massi M
Do scientists' and public preferences diverge? Analysing expert and public preferences for environmental and social outcomes for the Swan River.	2010	ARC Linkage	\$160,000	Pannell D J, Rolfe J C, Burton M P, Meeuwig J J
A comparison of diver and remote based benthic sampling.	2010	Chevron – URS	\$155,000	Meeuwig J J, Waddington K I
Survey of the fish at Barrow Island	2010	Chevron – RPS	\$233,782	Meeuwig J J, McLean D, Harvey E S.
Benchmarking seagrass in Cockburn Sound	2010	Cockburn Sound Management Council	\$45,285	Meeuwig J J, Waddington K I
Benchmarking the fish assemblages of Barrow Island	2010	Chevron – RPS	\$45,932	Meeuwig J J, McLean D, Harvey E S
Analysis of fish transects from the Monte Bello Islands	2010	Dept Environment and Conservation	\$24,998	Meeuwig J J
The missing link - identifying ocean nutrient fluxes to Ningaloo	2010	National Steering Committee Ship Time	\$920,000	Waite A et al
Training voyage in transit	2010	National Steering Committee Ship Time - ANNiMS	\$560,000	Waite A, Trull T
The biological oceanography of western rock lobster larvae	2010	National Steering Committee Ship Time	\$840,000	Waite A, Beckley L, Thompson P A, Caputi N, Jeffs A
Biological oceanography of western rock lobster larvae	2010 - 2012	Fisheries Research and Development Council	\$405,000	Waite A, Beckley L, Thompson P A
Reef ocean interactions	2010	Endeavour Award	\$25,400	Saunders M, Waite A
DOMGAS: Marine Baseline Survey Part B	2010	Chevron	\$149,054	Harvey E
DOMGAS: mangrove stereo BRUVs trial	2010	Chevron	\$36,720	Harvey E
Proof of the use of stereo-video counting and measuring the lengths of southern bluefin tuna in commercial trials	2010	Australian Fisheries Management Authority	\$252,342	Harvey E, Newman S, Williams N, Hayward M, Frusher S

TITLE	FUNDING PERIOD	FUNDING BODY	AMOUNT	SUPERVISORS
The use of BRUVs as a tool for assessing marine fisheries and ecosystems: a review of the hurdles and potential.	2010	Fisheries Research and Development Corporation	\$30,000	Harvey E, Newman S, Williams A, Hayward M, Frusher S
Establishing a baseline reef fish monitoring program, Rottnest Island Year 2	2010	Rottnest Island Authority	\$55,423	Harvey E, Langlois T
Ocean response to tropical cyclone forcing	2010	ARC Linkage Grant	\$924,000	Ivey G, Jones N, Lowe R, Wake G, McConochie J
Internal tides and continental shelves	2010	MISTI Global Seed Fund	\$31,000	Peacock T, Ivey G
Coral calcification and reproductive cycles	2010	MScience	\$119,244	Kendrick G, Heyward A



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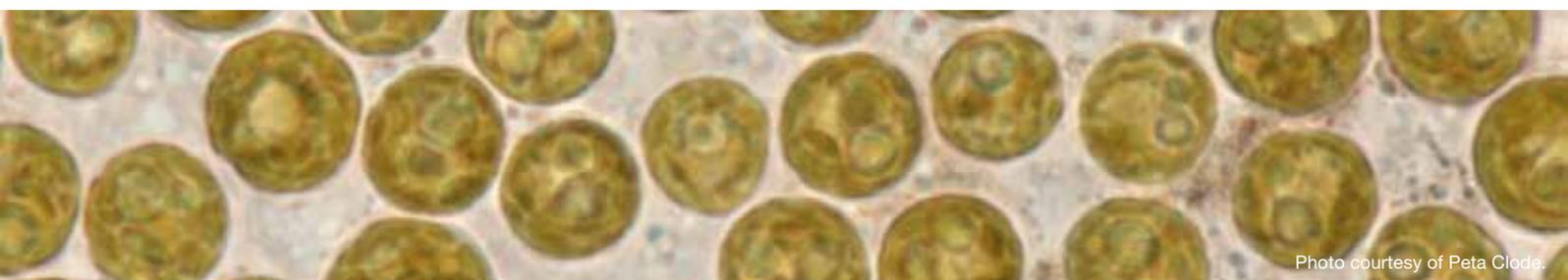


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Acronyms

Acronyms

AB	Animal Biology
AIMS	Australian Institute of Marine Science
ANNiMS	Australian National Network in Marine Science
ARC	Australian Research Council
CMF	Centre for Marine Futures
CMCA	Centre for Microscopy, Characterisation and Analysis
COFS	Centre for Offshore Foundation Systems
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEC	Department of Environment and Conservation
DoF	Department of Fisheries
FECM	Faculty of Engineering, Computing & Mathematics
FNAS	Faculty of Natural & Agricultural Sciences
IMEDEA	Mediterranean Institute for Advanced Studies
OI	Oceans Institute
PB	Plant Biology
SESE	School of Environmental Systems Engineering
SEE	School of Earth and Environment
SERPENT	Scientific and Environmental ROV Partnership using Emergencies
WAMSI	Western Australian Marine Science Institution



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